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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/845,250	05/01/2001	Gregory Morgan Evans	EVANS 6	2849

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EXAMINER	
WARE, CICELY Q	

ART UNIT	PAPER NUMBER
2634	6

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/845,250	EVANS ET AL.	
	Examiner	Art Unit	
	Cicely Ware	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 May 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-5, 7, 9, 10, 15-17, 19-24 rejected under 35 U.S.C. 103(a) as being unpatentable over Russell et al. (US patent 6,091,722) in view of Ayoub et al. (US Patent Application 2002/010980).

(1) With regard to claim 1, Russell et al. discloses in (Fig. 3, Fig. 4) a line balance correction device for correcting longitudinal balance of a copper pair (Fig. 1 (120)) , the device is adapted to be connected in parallel to the copper pair and to a local ground, and comprising: a controller (Fig. 2 (280)) (col. 7, lines 30-30, col. 8, lines 20-28).

Russell et al. does not explicitly disclose a copper pair. However it is well known in the art that a copper pair is a twisted pair telephone line or loop. In which Russell et al. discloses a plurality of subscriber loops, which are inherently copper pairs.

However Russell et al. does not disclose at least one variable resistor for connecting to each wire of the copper pair, wherein the resistance of each said at least one variable resistor is independently controlled by said controller for matching, at least up to an acceptable resistance difference level, resistance of signals carried over a corresponding wire of the copper pair to the local ground.

However Ayoub discloses in (Fig. 1 and Fig. 4) wherein at least one variable resistor for connecting to each wire of the copper pair, wherein the resistance of each said at least one variable resistor is independently controlled by said controller (Fig. 1 (120) and Fig. 4 (120)) for matching, at least up to an acceptable resistance difference level, resistance of signals carried over a corresponding wire of the copper pair to the local ground (Fig. 1 (104) and Fig. 4 (104)) (Pg. 1, col. 1, lines 36-48, col. 2, lines 19-24).

Therefore it would have been obvious to one of ordinary skill in the art to modify Russell et al. to incorporate wherein at least one variable resistor for connecting to each wire of the copper pair, wherein the resistance of each said at least one variable resistor is independently controlled by said controller for matching, at least up to an acceptable resistance difference level, resistance of signals carried over a corresponding wire of the copper pair to the local ground in order to create a higher values of balance, which results in better longitudinal noise rejection (Ayoub et al., Pg. 1, col. 1, lines 43-46).

Ayoub et al. does not explicitly disclose a copper pair. However it is well known in the art that a copper pair is a twisted pair telephone line or loop. In which Ayoub et al. discloses a subscriber line, which is inherently a copper pair.

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Ayoub et al. further discloses at least one current source for connecting to each wire of the copper pair, each said at least one current source being independently controlled by said controller for providing at least one cancellation signal for reducing at least one of the following: common-mode noise; and differential signal imbalance (Pg. 1, col. 1, lines 41-48, col. 2, lines 39-45, Pg. 2, col. 2, lines 1-38).

Ayoub et al. does not explicitly disclose common-mode noise nor differential signal imbalance. However it is well known in the art that common-mode noise is defined by a differential signaling. A differential signal is where two nodes have equal but opposite signal excursions around a fixed potential. The two nodes should exhibit equal impedance to that potential. The center potential in differential signaling is called the common mode level. In which, Ayoub et al. discloses wherein impedance imbalance causes a longitudinal imbalance which is inherently a differential signal imbalance which causes common-mode noise.

(3) With regard to claim 3, claim 3 inherits all the limitations of claim 1. Ayoub et al. discloses at least one voltage detector operatively associated with said controller for enabling said controller to compute at least one of the following: a line imbalance; and common-mode noise versus differential signal imbalance (Pg. 1, col. 1, lines 41-48, col.2, lines 10-20, 29-46).

(4) With regard to claim 4, claim 4 inherits all the limitations of claim 2 and 3.

(5) With regard to claim 5, claim 5 inherits all the limitations of claim 3. Ayoub et al. further discloses wherein said at least one voltage detector comprises at least one of the following: at least one root-mean-square (RMS) voltage detector; at least one peak voltage detector; and an xDSL signal type detector (Pg. 1, col. 2, lines 10-16).

(6) With regard to claim 7, claim 7 inherits all the limitations of claim 5. Ayoub et al. further discloses in (Fig. 1) wherein said at least one voltage detector provides to said controller at least one of the following: an RMS value of a signal carried on a Tip wire of the copper pair; an RMS value of a signal carried on a Ring wire of the copper pair; a peak value of a signal carried on a Tip wire of the copper pair (100, 105); and a peak value of a signal carried on a Ring wire of the copper pair (101, 106).

(7) With regard to claim 9, claim 9 inherits all the limitations of claim 5. Ayoub et al. further discloses in (Fig. 4) wherein said at least one peak voltage detector (100, 105) comprises at least one peak voltage detector (101, 106) for each wire of the copper pair (Pg. 1, col. 2, lines 10-23).

(8) With regard to claim 10, claim 10 inherits all the limitations of claims 3 and 7. Ayoub et al. further discloses in (Fig. 1) a programmable switch (104) operatively controlled by said controller (120) (Pg. 1, col. 1, lines 50-57).

(9) With regard to claim 15, claim 15 inherits all the limitations of claim 1. Russell et al. further discloses wherein said device corrects longitudinal balance of a copper pair carrying one of the following: unidirectional signals and bi-directional signals (col. 8, lines 20-28).

(10) With regard to claim 16, claim 16 inherits all the limitations of claims 1 and 2.

(11) With regard to claim 17, claim 17 inherits all the limitations of claims 1 and 3.

(12) With regard to claim 19, claim 19 inherits all the limitations of claim 1. Russell et al. further discloses in (Fig. 1) An xDSL transmission system comprising: an xDSL Transceiver Unit central office (xTU-C) (140); an xDSL Transceiver Unit remote unit (xTU-R); a copper pair (120) operatively associating said xTU-C with said xTU-R (abstract, col. 2, lines 56-67, col. 3, lines 1-5, col. 4, lines 17-20, 45-49, col. 7, lines 60-62).

(13) With regard to claim 20, claim 20 inherits all the limitations of claims 16 and 19.

(14) With regard to claim 21, claim 21 inherits all the limitations of claims 17 and 19.

(15) With regard to claim 22, claim 22 inherits all the limitations of claim 1.

(16) With regard to claim 23, claim 23 inherits all the limitations of claim 2.

(17) With regard to claim 24, Ayoub et al. further discloses detecting, for each wire of said copper pair, at least one of the following: a RMS voltage; and a peak voltage; and using at least one of said RMS voltage and said peak voltage to compute at least one of the following: a line imbalance; and common-mode noise versus differential signal imbalance (Pg. 1, col. 1, lines 46-48, col.2, lines 10-46, Pg. 3, col. 1, lines 48-67).

4. Claims 6, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell et al. (US patent 6,091,722) in combination with Ayoub et al. (US Patent Application 2002/010980) as applied to claims 1, 2 and 3 above, and further in view of Kantschuk (US Patent 6,683,913).

(1) With regard to claim 6, claim 6 inherits all the limitations of claim 3. Russell et al. in combination with Ayoub et al. disclose all the limitations of claim 3 above.

However Russell et al. in combination with Ayoub et al. do not disclose a band-pass filter operatively associated with said at least one voltage detector, the band-pass filter being programmable throughout a frequency band of an xDSL transmission and operative to output band-limit signals to said at least one voltage detector.

However Kantschuk discloses in (Fig. 1 and Fig. 10) a band-pass filter (Fig. 1 (32)) operatively associated with said at least one voltage detector (Fig. 10 (130)), the band-pass filter being programmable throughout a frequency band of an xDSL transmission and operative to output band-limit signals to said at least one voltage detector (col. 1, lines 22-25, col. 7, lines 34-35, 42-45, col. 8, lines 40-49).

Kantschuk does not explicitly disclose a voltage detector. However it is well known in the art that power is a measure of voltage and current. Therefore a power detector inherently detects voltage.

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Russell et al. in combination with Ayoub et al. to incorporate a band-pass filter operatively associated with said at least one voltage detector, the band-pass filter being programmable throughout a frequency band of an xDSL transmission and

operative to output band-limit signals to said at least one voltage detector in order to eliminate interference outside a frequency range of interest to the receiver (Kantschuk, col. 7, lines 34-35).

(2) With regard to claim 12, claim 12 inherits all the limitations of claim 1. Kantschuk further discloses an xDSL signal type detector operatively associated with said controller for enabling said controller to compute common-mode noise versus differential signal imbalance (col. 1, lines 22-25, col. 7, lines 10-14, 31).

(3) With regard to claim 13, claim 13 inherits all the limitations of claims 2 and 12.

5. Claims 8, 11, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russell et al. (US patent 6,091,722) in combination with Ayoub et al. (US Patent Application 2002/010980) as applied to claims 1, 5 and 12 above, and further in view of Bisson et al. (6323686).

(1) With regard to claim 8, claim 8 inherits all the limitations of claim 5. Russell et al. in combination with Ayoub et al. disclose all the limitations of claim 5 above. However Russell et al. in combination with Ayoub et al. do not disclose wherein said at least one RMS voltage detector comprises at least one RMS voltage detector for each wire of the copper pair.

However Bisson et al. discloses wherein said at least one RMS voltage detector comprises at least one RMS voltage detector for each wire of the copper pair (col. 1, lines 33-38, col. 3, lines 21, 22, 28, 29, 63-64).

Bisson et al. does not explicitly disclose a copper pair. However it is well known in the art that a copper pair is a twisted pair telephone line or loop.

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Russell et al. in combination with Ayoub et al. to incorporate wherein said at least one RMS voltage detector comprises at least one RMS voltage detector for each wire of the copper pair for a low power drive stage that is capable of handling high crest factors (Bisson et al., col. 2, lines 6-9).

(2) With regard to claim 11, claim 11 inherits all the limitations of claim 1. Bisson et al. further discloses a power supply operative to supply electric power to active components of the device (col. 3, lines 49-56, col. 4, lines 37-38, col. 6, lines 33-34).

(3) With regard to claim 14, claim 14 inherits all the limitations of claim 12. Bisson et al. further discloses wherein said xDSL detector is operative to provide at least one differential-mode component for enabling the controller to compute at least one peak voltage-to-RMS voltage ratio for analyzing common-mode noise versus differential signal imbalance (col. 1, lines 33-42, col. 2, lines 39-40, col. 3, lines 26-27).

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ayoub (US Patent Application 2002/0101980) in view of Kantschuk (US Patent 6,683,913) and further in view of Bisson et al. (US Patent 6,323,686).

With regard to claim 18, Ayoub discloses in (Fig. 1 and Fig. 4) a line balance correction device for correcting longitudinal balance of a copper pair (Pg. 1, col. 2, lines 53-59, Pg. 2, col. 2, lines 35-39), the device being adapted to be connected in parallel to

the copper pair and to a local ground (Fig. 1 (104), Fig. 4 (104), the device comprising: a controller(Fig. 1 (120), Fig. 4 (120), (Pg. 1, col. 1, lines 50-52); at least one voltage detector operatively associated with said controller and operative to enable said controller to compute at least one of the following: a line imbalance; and common-mode noise versus differential signal imbalance (Pg. 1, col. 1, lines 41-48, col.2, lines 10-20, 29-46); at least one variable resistor for connecting to each wire of the copper pair, wherein the resistance of each said at least one variable resistor is independently controlled by said controller for matching, at least up to an acceptable resistance difference level, resistance of signals carried over a corresponding wire of the copper pair to the local ground (Pg. 1, col. 1, lines 36-48, col. 2, lines 19-24); at least one current source for connecting to each wire of the copper pair, each said at least one current source being independently controlled by said controller for providing at least one cancellation signal for reducing at least one of the following: common-mode noise; and differential signal imbalance (Pg. 1, col. 1, lines 41-48, col. 2, lines 39-45, Pg. 2, col. 2, lines 1-38).

However Russell et al. does not disclose a band-pass filter operatively associated with said at least one voltage detector, the band-pass filter being programmable throughout a frequency band of an xDSL transmission and operative to output band-limit signals to said at least one voltage detector; and a power supply operative to supply electric power to active components of the device.

However Kantschuk discloses in (Fig. 1 and Fig. 10) a band-pass filter (Fig. 1 (32)) operatively associated with said at least one voltage detector (Fig. 10 (130)), the

band-pass filter being programmable throughout a frequency band of an xDSL transmission and operative to output band-limit signals to said at least one voltage detector (col. 1, lines 22-25, col. 7, lines 34-35, 42-45, col. 8, lines 40-49).

Therefore it would have been obvious to one of ordinary skill in the art to modify Russell et al. to incorporate a band-pass filter operatively associated with said at least one voltage detector, the band-pass filter being programmable throughout a frequency band of an xDSL transmission and operative to output band-limit signals to said at least one voltage detector in order to eliminate interference outside a frequency range of interest to the receiver (Kantschuk, col. 7, lines 34-35).

However Russell et al. in combination with Kantschuk do not disclose a power supply operative to supply electric power to active components of the device.

However Bisson et al. discloses disclose a power supply operative to supply electric power to active components of the device (col. 3, lines 49-56, col. 4, lines 37-38, col. 6, lines 33-34).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Russell et al. in combination with Kantschuk to incorporate a power supply operative to supply electric power to active components of the device in order to allow for large crest-factor signals to occur statistically infrequently, which resulting allows for the power consumed at these occurrences to be negligible in comparison to normal conditions (Bisson et al., col. 6, lines 34-36).

Conclusion

7. The prior art made record and not relied upon is considered pertinent to applicant's disclosure:

a. Moore, III, US Patent 5,768,342 discloses a telephone system loop current detector.

b. Kelly US Patent 4,860,287 discloses a network having a synchronizer for synchronization between a primary and a remote station.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 703-305-8326. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
July 28, 2004

STEPHEN CHIN
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